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Situation analysis of the timber producers in Turkey Central Anatolia region

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Abstract

It is necessary for producers to use their economic resources and integrate to foreign markets in order to survive. By doing so, they contribute to national economic growth and provide employment opportunities. Since it is crucial for a country to make use of the present raw material, we analysed the common problems that timber producers face and tried to find solutions to these problems. For this purpose, we conducted this study using the survey technique on timber producers in the provinces of the Central Anatolian Region. According to data we obtained, 89% of the producers use natural drying method, all of them determine product prices according to the cost, and process a minimum of 15 m3 of timber daily. The fact that the most of the participants were either elementary school or high school graduates shows that the education level of this industry is insufficient compared to other enterprises. Also, 98.2% of the participants didn't export their products. This is a serious concern and possesses a danger for the future of the enterprises.

Keywords: forest product industry, raw ıssues, timber production, business problems.

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1. Introduction

The production industry, which is the main pillar of the economic development, has a major role in a country's production and employment rates. Both across the country and within the regional restructuring, the production industry underlies the balanced development and it consists of various activity areas formed by different groups. These groups have production values of various properties and shape the economic growth (Berber, 1996). In order to eliminate the differences between regions in terms of development, which is an outcome of the inequality of resources, we must analyze enterprises of the production industry in detail and make use of existing resources in the best way possible (Akyuz, 2000).

These enterprises carry out their activities in terms of economy, technology and social environment. The success and thus the survival of these enterprises largely depends on to what extent they can foresee and seize the possible constraints and opportunities around them. The phenomenon of globalism created a competition environment which is more fierce compared to the past. In this environment, enterprises need to adopt to the changes and innovate in order to survive and profit The mobility of the environment and the complicated external factors increase the uncertainty of the environment. On the other hand, with the increasing intense competition in the international economy, enterprises are in danger of shutting down (Demir & Sutcu, 2002). It is possible to say that the technological capacity of the Turkish economy depends mainly on import and adaptation of this imported technology to the local conditions. The technological structure is mostly up-to-date, the technologies produced in foreign countries are followed closely, and these are adapted to the local conditions (Sariaslan, 1996). Wood processing industries are mainly composed of small enterprises although there are a few medium-scale companies. Many small-scale furniture enterprises and sawmills, with labor-intensive technologies, provide employment and income opportunities in the poor, rural areas and, as such, the sector is of importance with respect to employment creation and reducing regional differences in income distribution (Aksu,Koc & Kurtoglu, 2011).

These SMEs try to improve in terms of technology. We can see that the number of SMEs who can invent technologies, make innovations and use high technologies increases rapidly. Accordingly, a considerable part of the inventions are made by these SMEs and this increases their competitiveness and export opportunities (Fusunoglu, 1993). Because of the problems regarding high quality raw material supply in recent years, enterprises can't acquire sufficient high quality raw material and can't prevent the disruptions caused by the changes in prices, thus continue their activities with their limited market structures. Changes and developments in social structure brought about an increase in demand for industrial wood products, accordingly, an increase in production, import and export of forest products (Kurtoglu, Koc, Erdinler & Sofuoglu, 2009). Rapid population growth and consumer pressure caused an increase in the demand for natural resources and this created the necessity of efficient, effective and sustainable management of forest resources which is declining because of unconscious and excessive use. Forests, which are renewable natural resources, should be managed with modern, sustainable methods in order to optimize the efficiency and meet the demands of today's and future generations (Akay et al., 2007). In our country, wood raw materials, which are the Government Forest Enterprises' (GFE) main sources of income, should be produced using sustainable and appropriate methods (SPO, 2006).

Increasing competition conditions and consumer demands force forest enterprises to sell their products for lower prices (Caliskan, 2008). Accordingly, if we consider that the demand for forest products will increase in our country and across the world, it is obvious that even the slightest drop in wood raw material shouldn't be ignored (Acar & Senturk, 1996). In our country, there are 21.2 million hectares of forest, half of which is coniferous and the other half is leafy, covering 27.2% of the surface area (Anonymous, 2007). In forest industry, enterprises acquire wood raw material from Forest Enterprises. Considering these, there is an important relationship between forest industry and forest enterprises (Gultekin, Kayacan & Koc, 2009). According to General Directorate of Forestry data, 7-8 million m3 of industrial wood is produced. It is thought that firewood production from state-owned

forests dropped from 20 million stere to 7,5 million stere in the last 30 years and the production of firewood will decrease (Kaplan, 2008).

The round wood consumption is around 12-13 million m3 in Turkey, and 75% of this consumption is met from state-owned forests. The remaining 25% is met from private forests and from areas that are smaller than 3 hectares and not considered as forests or by importing rapid growing trees (Kok, 2009). As wood raw material; log, wire pole, mine pole, industrial wood and firewood are produced in Turkey (Acar & Senturk, 2000). Among these wood raw materials, log takes the first place in terms of production amount and economic value. As of 2008, the total amount and the economic value of produced timber is approximately 34.19% and 49% of the the total amount and the economic value of produced wood raw material respectively (GDF, 2009).

Timber production is done by private enterprises in Turkey. Some of these enterprises use modern technologies and methods. But an important part of these enterprises use low capacity machines with old technologies and usually operate seasonally. These enterprises are usually micro-sized enterprises and have less than 10 employees. While main processes are done using labor force and/or simple machines and there are no special machines or facilities in primitive production facilities, in modern production facilities hydraulic, pneumatic, numerical or computer-controlled machines are used on all stages of the production (Sakarya & Canli, 2011). World production of wood based panel has grown from 63,1 million cubic meters in 2005 to 75,5 million m3 in 2009, a 12 million m3 rise in production. China is the world's largest wood based panel's manufacturer. The Turkish wood based panels industry has shown a tendency of fluctuating during this time. Turkey, as the world's 4th largest producer of wood based panels, is an important contributor to the industry. Turkey has made great strides in the last 20 years in the forest products industry. Both the development of new materials and techniques of domestic and international market demand have played a decisive role. Turkey's wood panel production has gone from 100000 m3 in the early 2000s, to 5.5 million m^3 of production in 2010. The sector's total production capacity is approximately 9 million m^3 (Yildirim, Candan & Korkut, 2014).

In Turkey, approximately 70% of timber products are used in construction, 20% is used in furniture, and 10% is used in packaging and other industries. The timber consumption per capita in Turkey is between 0.075m^3 and 0.085 m^3. The estimated value of a machine park necessary for a timber factory is about $250.000, and the necessary area for such a machine part is about 1.100 m^2. Assuming 15 employees work for 8 hours in a single shift, depending on the saw and timber type, the monthly timber production capacity is a approximately 2000-3000 m^3. The timber production per capita in Turkey is less than 0.1 m^3 (Sakarya & Canli, 2011). In recent years the use of wood-based panels such as fiberboard, particleboard, oriented strandboard, plywood etc., for several applications has been gaining great importance due to their properties (Ustaomer & Usta, 2012). The forest products industry which has various problems such as lack of demand, the shortage of funding, lack of marketing organization and bureaucracy (Cindik, Akyuz & Serin, 2002) continue their productions facing problems especially in terms of raw material supply and use (Serin, 1997). The purpose of this study is to point out these problems and create awareness.

2. Material And Method

2.1. The Purpose of the Study

The main hypothesis of this study is to determine the factors that affect the timber producers' situation in the sector. We conducted this study in order to determine, analyze and create awareness about the timber producers' sectoral situation. The reason we chose to analyze the timber producers' situation is as follows;

-Marketing activities based on price,
-Raw material selection based on quality,
-Production activities based on experience,
-Machinery and equipment use based on technology

We used "the survey technique" in order to obtain data. The data covers the 2012-13 activities of the enterprises. The survey was done on the enterprises in the provinces of Central Anatolian Region. The participant enterprises were picked using the random sampling method. A total of 165 enterprises participated to the survey and we used the face-to-face interview method. Each enterprise filled only one survey.

2.2. Evaluation of graphical findings on timber producers

We used practical methods in order to evaluate the graphical findings. The obtained data is given in the following tables below.

Table 1. Demographic Characteristics of Enterprises

Operating times of the enterprises	Frequency	Percentage %
0-3 Years	0	0
4-7 Years	9	5.5
8-11 Years	69	4.,8
12 and More	87	52.7
The total number of people working in the enterprises		
1-9 Persons	0	0
10-14 Persons	21	12.7
15-19 Persons	90	54.5
20-24 Persons	42	25.5
25 and More	12	7.3
The number of industrial vocational high school graduates working in the enterprises		
1-2 Persons	45	27,2
3-4 Persons	48	29
5-6 Persons	3	1,8
The number of high school graduates working in the enterprises		
1-2 Persons	48	10
3-4 Persons	12	7.2
5 and More	3	1.8
The number of elementary school graduates working in the enterprises		
1-9 Persons	0	0
10-14 Persons	54	32.7
15-19 Persons	87	52.7
20 and More	24	14.6
The situation of the floor on which the timber and logs are kept		
Concrete	153	92.7
Gravel	12	7.3
Soil	0	0
The height of the timber and log pile		
0-10 cm	35	21.2
11-20 cm	45	27.2
21-30 cm	55	33.3
31-40 cm	30	18.3
The layout of the area in which the timber and logs are kept according to climate		
There is	165	100
There isn't	0	0
The places that enterprises stock the timber		
In the Warehouse	9	5.5
In The Workplace	144	87.3
In The Open Field	12	7.2
Total	165	100

Evaluating the results of the surveys (Table 1), it is seen that 52.7% of the enterprises participated in the survey have been carrying out their activities for at least 12 years. This suggests that these enterprises have a considerable amount of sectorial experience. 54.5% of the enterprises participated in the survey had 15-19 employees. Considering the educational background of the employees, 56.2% of the enterprises had 1-2 or 3-4 industrial vocational high school graduates, 17.2% of the enterprises had 1-2 or 3-4 high school graduates and 52.7% of the enterprises had 15-19 elementary school graduates. From this data, we can conclude that most of the enterprises had qualified employees. 92.7% of the enterprises preferred concrete floor and 7.3% of the enterprises preferred gravel floor to pile the logs and timbers. 100% of the enterprises designed the layout of the area where logs and timbers are kept according to climate. 5.5% of the enterprises stored the timber in a warehouse, 87.3% in the workplace and 7.2% in an open field. We can conclude that the physical structures of the enterprises are suitable for timber processing and production.

Table2. The Machinery Information of the Enterprises

The machinery investments of the enterprises (TL)	Frequency	Percentage (%)
0-299.000	3	1.8
300.000-399.000	33	20
400.000-499.000	96	58.2
500.000 and More	33	20
The machines used in timber cutting		
Band Saw	66	40
Multi-blade	141	85
Thicknesser	6	4
Planer	159	96
Header	165	100
Band Grinder	162	98
Band Welder	159	96
Scroll Saw	165	100
Circular Saw	156	95
Band Saw with Carriage	165	100
Circular Saw Grinder	3	1.81
The machinery repair and maintenance methods of the enterprises		
By the worker who operates the machine	0	0
By the existing repair and maintenance unit	9	16
By calling the service	46	84
The grinding methods of the enterprises		
By the grinding maintenance unit	53	96
Outsourcing	2	4
The grinding machines used by the enterprises		
Band Saw Grinder	162	98
Band Saw Welding	159	96
Circular Saw Grinder	3	1.81
Total	165	100

As can be seen in Table 2, 58,2% of the enterprises invested 400.000–499.999 TL on machinery, 20% invested 300.000–399.999 and finally 21,8% invested more than 500.000 TL. Most of the timber producers called the service for the repair and maintenance of the machines. 96% of the enterprises used their own grinding unit in order to grind the blades, while 4% met their needs by outsourcing. All

of the enterprises participated in the study had a header, a scroll saw, band saw and a band saw with carriage. These were the most widely used machines in timber production

Table 3. The Raw Material Product Processes Used by the Enterprises

	Frequency	Percentage %
The timber types used by the enterprises		
Red Pine	117	71
Black Pine	42	25
Imported Pine	51	31
The timber storage times of the enterprises		
1-30 Days	25	15
31-89 Days	75	46
90-179 Days	20	12
180-365 Days	40	24
365 and Up	5	3
The conditions that costumers take into account while buying timber		
Favorable Terms of Payment	102	61.8
Affordable Prices	109	66
Timber With Qualities That Fits the Purpose of Production	97	58.7
Quality	80	48.5
The drying furnace utilization rates of the enterprises		
Yes	18	11
No	147	89
The drying methods used by the enterprises		
Natural drying	147	89
Ventilation Systems	0	0
Drying Furnaces	18	11
The timbers that are dried in the drying furnaces		
Red Pine	9	50
Black Pine	3	16.6
Imported Pine	6	33.4
Total	165	100

As can be seen in Table 3, with 71% calabrian pine was the most widely used timber type, imported pine was the second with 31%, and black pine took the third 3rd place with 25%. 89% of the enterprises participated in the survey didn't use a drying furnace. The most widely used drying method was natural drying with 89%, while 11% or the enterprises used a drying furnace. 50% of the enterprises dried calabrian pine in the drying furnace, while 33.4% dried imported pine and 16.6% dried black pine.

Table 4. The Raw Material Storage Processes of the Enterprises

		Frequency	Percentage %
The open field area of the enterprises (m^2)			
0-499		0	0
500-999	0		0
1000-1499		0	0
1500-1999		12	7.3
2000-2499		36	21.8
2500-2999		78	47.3
3000 and More		39	23.6
The closed field area of the enterprises (m^2)			
0-499		0	0
500-999	18		11
1000-1499		102	61.8
1500-1999		39	23.6
2000 and More		6	3.6
The pile mounting use of the enterprises			
Yes		159	96.4
No		6	3.6
The methods used by the enterprises in order to maintain the timbers in the warehouse			
Direction of the wind	30		54.54
Direction of the sun	12		21.81
Logs and timbers		15	27.27
Against the Cracks	41		74.54
The methods used by the enterprises in order to pile logs and timbers			
Timber is used		129	78.2
Piling equipment is used		36	21.8
The Piling methods used by the enterprises			
Crate Stacking		162	98.2
Cross Stacking		3	1.8
The points taken into account while piling			
Direction of the wind	51		92.72
Proper Sizing		51	92.72
Direction of the Sun	13		23.63
The timber transportation tools used by the enterprises			
Forklift		144	87.27
Scoop		165	100
Total		165	100

As can be seen in Table 4, 13% of the enterprises used impregnation, while 87% didn't. All the enterprises pressure impregnation, full-cell impregnation and empty-cell impregnation method were used. The vehicles used in order to transport timbers from production to cutting were forklifts and excavators.

Table 5. The Impregnation Processes of the Enterprises

	Frequency	Percentage %
The impregnation facility use of the enterprises		
Yes	21	13
No	144	87
The impregnation methods used by the enterprises		
High Freguence	0	0
Pressure İmpregnation	7	33.3
Oscillation	0	0
Full-Cell method	7	33.3
Empty-Cell method	7	33.3
Burnett Method	0	0
Cellon-Drillon Method	0	0
Hydro-Jet Method	0	0
Total	165	100

As can be seen in Table 5, the enterprises determined timber prices according to the cost. 93.36% of the enterprises sold their products through dealers and 3.63% through sales representatives. The rate of wastage of the enterprises changed between 0% and 25%. The majority of the wastes were sold or used as firewood. 54% of the enterprises used piece wastes as firewood, 6% used them to make decorative objects, 18% recycled with finger joint and 12% used other methods. Thus, the enterprises contribute to recycling by using the wastes according to their needs. 29.1% of the enterprises had a daily log processing capacity of 15-19 m³, 32.7% had a daily log processing capacity of 20-24 m³, 14.6% had a daily log processing capacity of 25-29 m³, and 23.6% had a daily log processing capacity of more than 30 m³. 2% of the enterprises had an annual log processing capacity of 0-4999m³, 56% had an annual log processing capacity of 5000-7499m³, 22% had an annual log processing capacity of more than 10.000 m³. Considering the difference between the buying and selling prices of timber, 11% applied a sales difference of 100-149 TL, 60% applied a sales difference of 150-190 TL, 13% applied a sales difference of 200-249 TL and 16% applied a sales difference of more than 250 TL. 18.2% of the participants had a capital of 400.000–599.999 TL, 56.4% had a capital of 600.000–799.999 TL, 18.2% had a capital of 800.000–999.999 TL and 7.2% had a capital of more than 1.000.000 TL.

Table 6. The Raw Material Processes Used by the Enterprises

The price determination of the enterprises	Frequency	Percentage %
According to the cost	165	100
According to market prices Other	0	0
The export of the enterprises		
Yes	3	1.8
No	162	98.2
The sale methods of the enterprises		
Directly from the factory or Online	0	0
Through sales representatives 6	3.63	
Through dealers	159	96.36
The rate of wastage of the enterprises during timber production		
0-25 %	165	100
26-50 %	0	0
The wastage handling methods used by the enterprises		
By selling 150	90.9	
Wood	117	70.9
Sawdust	18	10.9
By producing thin plates	3	1.8
The piece waste handling methods used by the enterprises		
By using os firewood 90	54	
By making decorative objects 12	6	
Recycling by finger joint	30	18
Others	20	12
The annual timber processing amounts of the enterprises (m^3)		
0-4999	3	2
5000-7499	93	56
7500-9999	33	20
10000 and More	36	22
Total	165	100

As can be seen Table 6, considering the common problems of the timber producers, 12.7% was not being able to find raw material of desired quality, 67% thought raw material prices were too high, 72% thought transportation costs were too high, 60% complained about lack of funding, 49% complained about lack of technology, 35% complained about lack of demand, 7% complained about delays in debt collection, and 6% complained about other issues.

Table 7. Demographic Information of the Participants

The positions of the participants	Frequency	Percentage %
Owner	129	78.2
Manager	24	14.6
Business Partner	9	5.4
Accountant	3	1.8
The ages of the participants		
21-30	3	1.8
31-40	30	18.2
41-50	117	71
51 and Up	15	9
The Educational backgrounds of the participants		
Primary Education	51	30.9
High School	90	54.54
College-University	24	14.54
Total	165	100

As can be seen Table 7, 78.2% of the participants representing the enterprise were the owner, 14.6% were the manager, 1.8% were the accountant; 1.8% were between 21-30 years old, 18.2% were between 31-40 years old, 71% were 41-50 years old and 9% were older than 51 years old. The fact that more than 70% of the participants were middle aged or older indicates that these people had a good amount of sectoral experience. 30.9% of the participants representing the enterprise were elementary school graduates, 54.4% were high school graduates and 14.54% were vocational high school or university graduates. 1.8% of these people had 4-7 years of experience, 3.6% had 8-11 years of experience, and 94.6% had more than 12 years of experience.

3. Results, Discussion and Suggestions

The timber producers need to figure out the factors which will minimize the rate of wastage and cut the timber in accordance with these techniques. It is utterly important that the raw materials are used with minimum wastage both for the enterprises' profits and country's economy. In order to minimize the rate of wastage, the timber needs to be cut into shorter pieces with smaller cross sections with minimum waste. The employees need to be skilled, and do their job in the best possible way and also maintain the machinery in the best condition possible. Also, the machinery should be replaced with the new ones according to technological developments, if necessary. The piece wastes can be recycled by being cut using the finger joint machine, thus making them usable. The remaining piece wastes can be used as firewood, thus meeting the enterprises' heating needs.

Conflict of Interests *The authors declares no competing interests.*

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